

APS SOURCE PARAMETERS

Undulator A

Period: 3.30 cm

Length: 2.4 m

K_{\max} : 2.74 (effective; at minimum gap)

Minimum gap: 10.5 mm

Tuning range: 3.0-13.0 keV (1st harmonic)

3.0-45.0 keV (1st-5th harmonic)

On-axis peak brilliance:

$4.6 \times 10^{19} \text{ ph/s/mrad}^2/\text{mm}^2/0.1\% \text{ bw}$ at 7 keV

Source size and divergence at 8.0 keV:

Σ_x : 273 μm

Σ_y : 10 μm

Σ_x : 12.6 μrad

Σ_y : 6.6 μrad

2.70-cm Undulator (sector 3)

Period: 2.70 cm

Length: 2.4 m

K_{\max} : 2.18 (effective; at minimum gap)

Minimum gap: 8.5 mm

Tuning range: 5.1-16.0 keV (1st harmonic)

5.1-60.0 keV (1st-5th harmonic)

On-axis peak brilliance:

$6.4 \times 10^{19} \text{ ph/s/mrad}^2/\text{mm}^2/0.1\% \text{ bw}$ at 8 keV

Source size and divergence at 8.0 keV:

Σ_x : 273 μm

Σ_y : 10 μm

Σ_x : 12.6 μrad

Σ_y : 6.6 μrad

5.50-cm Undulator (sector 2)

Period length: 5.50 cm

Length: 2.4 m

K_{\max} : 6.57 (effective; at minimum gap)

Minimum gap: 10.5 mm

Tuning range: 0.4-7.0 keV (1st harmonic)

0.4-25.0 keV (1st-5th harmonic)

On-axis peak brilliance:

$1.9 \times 10^{19} \text{ ph/s/mrad}^2/\text{mm}^2/0.1\% \text{ bw}$ at 4 keV

Source size and divergence at 4.0 keV:

Σ_x : 273 μm

Σ_y : 10 μm

Σ_x : 13.8 μrad

Σ_y : 8.7 μrad

APS Bending Magnet

Critical energy: 19.51 keV

Energy range: 1-100 keV

On-axis peak brilliance:

$5.6 \times 10^{15} \text{ ph/s/mrad}^2/\text{mm}^2/0.1\% \text{ bw}$ at 16.3 keV

On-axis peak angular flux:

$9.6 \times 10^{13} \text{ ph/s/mrad}^2/0.1\% \text{ bw}$ at 16.3 keV

On-axis peak horizontal angular flux:

$1.6 \times 10^{13} \text{ ph/s/mradh}/0.1\% \text{ bw}$ at 5.6 keV

Source size and divergence at the critical energy:

Σ_x : 91 μm

Σ_y : 30 μm

Σ_x : 6 mrad

Σ_y : 47 μrad

Circularly Polarized Undulator (sector 4)

Period: 12.8 cm

Length: 2.1 m

Circular mode:

K_{\max} : 2.65 (effective; for both horizontal and vertical fields at maximum currents 1.2 kA horizontal and 0.34 kA vertical)

B_{\max} : 0.26 T (peak fields)

Tuning range: 0.5-3.0 keV (1st harmonic)

On-axis peak circular brilliance:

$3.4 \times 10^{18} \text{ ph/s/mrad}^2/\text{mm}^2/0.1\% \text{ bw}$ at 1.8 keV

Linear mode:

K_{\max} : 2.80 (effective; for both horizontal and vertical fields at maximum currents 1.4 kA horizontal and 0.40 kA vertical)

B_{\max} : 0.29 T (peak fields)

Tuning range: 0.8-3.0 keV (1st harmonic)

0.8-10.0 keV (1st-5th harmonic)

On-axis peak linear brilliance:

$2.5 \times 10^{18} \text{ ph/s/mrad}^2/\text{mm}^2/0.1\% \text{ bw}$ at 2.1 keV

Switching frequency: 0-5 Hz

Switching rise time: 20 ms

Source size and divergence at 1.5 keV:

Σ_x : 273 μm

Σ_y : 10 μm

Σ_x : 17.9 μrad

Σ_y : 14.4 μrad

Elliptical Multipole Wiggler (sector 11)

Period length: 16.0 cm

Number of poles: 34 permanent magnets,
36 electromagnets

Length: 2.8 m

$K_{x\max}$: 1.3 (effective; at maximum current 1.15 kA)

$K_{y\max}$: 14.4 (peak; at minimum gap 24.0 mm)

Switching frequency: 0-10 Hz

Critical energy: 31.4 keV (at minimum gap)

Energy range: 5-200 keV

Source size and divergence at the critical energy:

Σ_x : 273 μm

Σ_y : 10 μm

Σ_x : 820 μrad (FWHM 1.9 mrad; non-Gaussian; linear mode)

Σ_y : 47 μrad (linear mode)